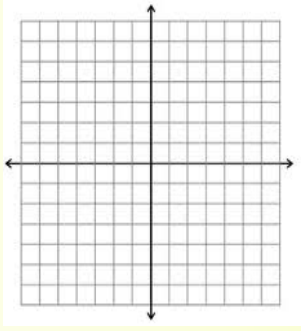
Alg. 2 Warm Up # 3- 5

1. completely factor:

a) $2x^2 - 18$ b) $5x^2 + 15x + 10$ c) $4x^3 - 100x$

2. Graph the function and its inverse:

$f(x) = \sqrt{x + 4}$



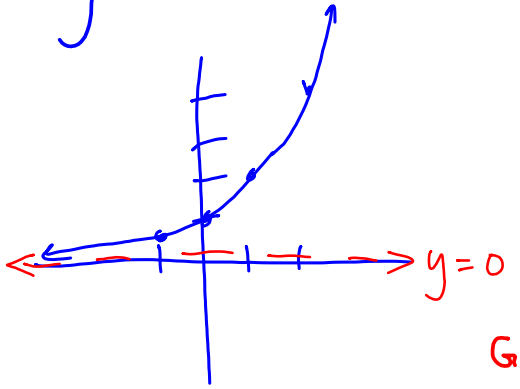
HW Questions:

Review & Preview

5-84. Write the equation of an increasing exponential function that has a horizontal asymptote at $y = 15$.

$y = 2^x$

x	y
0	1
1	2
2	4
-1	$\frac{1}{2}$



Go up 15

$y = 2^x + 15$

5-85. If $x = 7^y$, how would you write this equation in $y =$ form? Explain.

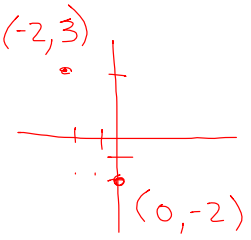
$y = \log_7 x$

5-86. Solve for n: $n^3 = 49$.

5-87. A circle has the equation $x^2 + (y+2)^2 = r^2$. If the circle is shifted 2 units to the left, 5 units up, and the radius is doubled, what will its new equation be?

$(x+2)^2 + (y-3)^2 = 4r^2$

$(2r)^2$



5-88. On Wednesdays at Tara's Taqueria four tacos are the same price as three burritos. Last Wednesday the Lunch Bunch ordered five tacos and six burritos, and their total bill was $8.58 (with no tax or drinks included). Nobody in the Lunch Bunch can remember the cost of one of Tara's tacos. Help them figure it out.

Let t = cost of a taco
b = cost of a burrito

$\begin{cases} 4t = 3b \\ 5t + 6b = 8.58 \end{cases}$

$2(4t - 3b = 0)$
$8t - 6b = 0$
$5t + 6b = 8.58$

5-89. Graph the two functions at right on the same set of axes. $y = 3(2^x)$, $y = 3(2^x) + 10$

a. How do the two graphs compare?

b. Suppose the first equation is $y = km^x$ and the graph is shifted up b units. What is the new equation?

$y = km^x + b$

5-90. Solve each equation or inequality.

a. $|x-1| = 9$

b. $2|x+1| + 3 = 9$

c. $|x-1| < 3$

d. $|x+5| \geq 8$

5-91. Factor each expression below.

a. $x^2 + 8x$

b. $x^2y^2 - 81z^2$

c. $2x^2 + 14x - 16$

d. $3x^2 - 11x - 4$

$(xy + 9z)(xy - 9z)$

5-92. For each of the following rational expressions, add or subtract, then simplify.

a. $\frac{2-x}{x+4}+\frac{3x+6}{x+4}$ $= \frac{2x+8}{x+4}$

b. $\frac{3}{(x+2)(x+3)}+\frac{x}{(x+2)(x+3)}$ $= \frac{1}{x+2}$

c. $\frac{3}{x-1}-\frac{2}{x-2}$ $= \frac{2(x+4)}{(x+4)}$

LCD $= (x-1)(x-2)$

$\frac{(x-2)}{(x-2)}\frac{3}{(x-1)}-\frac{2}{(x-2)}\cdot\frac{(x-1)}{(x-1)}$

$\frac{3x-6}{(x-2)(x-1)}-\frac{(2x-2)}{(x-2)(x-1)}$

$\frac{3x-6-2x+2}{(x-2)(x-1)}$

$\frac{x-4}{(x-2)(x-1)}$

$\frac{(x+2)}{(x+2)}\frac{8}{x}-\frac{4}{x+2}\cdot\frac{x}{x}$

$\frac{8x+16-4x}{x(x+2)}$

$\frac{4x+16}{x(x+2)}$

$\frac{4(x+4)}{x(x+2)}$

$\frac{4x+16}{x^2+2x}$

Blue CP's:

5-71. While the idea behind the Ancient Puzzle is more than 2100 years old, the symbol **log** is more recent. It was created by John Napier, a Scottish mathematician in the 1600's. "log" is short for **logarithm**, and represents the function that is the **inverse of an exponential function**. You can use this idea to find the inverse equations of each of the following functions. Find the inverses and write your answers in $y =$ form.

a. $y = \log_9(x)$ b. $y = 10^x$ c. $y = \log_6(x+1)$ d. $y = 5^{2x}$

inverse

$x = 10^y$

$\log_{10} x = y$

inverse

$x = \log_6(y+1)$

$6^x = y+1$

$y = 6^x - 1$

inverse

$x = 5^{2y}$

$\log_5 x = 2y$

$y = \frac{\log_5 x}{2}$

$y = \frac{1}{2}\log_5 x$

d) $\log_2 0 = ?$

$2^{?} = 0$

k) $\log_2 \sqrt[3]{2} = ? \rightarrow 2^{1/3} = \sqrt[3]{2}$

$2^{?} = 2^{1/3}$

g) $\log_2 \frac{1}{16} = -4 \rightarrow 2^{-4} = \frac{1}{16}$

exp

$2^{?} = \frac{1}{16}$

f) $\log_2 \sqrt{2} = \frac{1}{2}$

$2^{\frac{1}{2}} = \sqrt{2}$

$\frac{1}{2^4}$

Blue CP's:

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a. $y = \log_9(x)$ b. $y = 10^x$ c. $y = \log_6(x+1)$ d. $y = 5^{2x}$

Switch x & y for inverse:

$x = \log_6(y+1)$

Now write in exponent form:

$6^x = y+1$

Solve for y:

$\boxed{y = 6^x - 1}$

CP's: 5.2.3 Salmon worksheet

Remember: Investigating a function

- Multiple representations
- Domain and Range
- Intercepts
- Special Points
- Symmetry
- Asymptotes
- Continuous or Discrete
- Shape: curved or straight

Week 3 Classwork

Warm Up

5 - #55 ---> 58 (pink)

5 - #68 ---> 71 (blue)

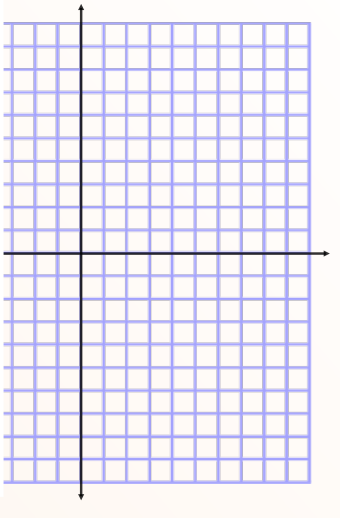
CP's: 5.2.3 Salmon worksheet

Remember: Investigating a function

- Multiple representations
- Domain and Range
- Intercepts
- Special Points
- Symmetry
- Asymptotes
- Continuous or Discrete
- Shape: curved or straight

2. $y = \log_4 x$

x	y
$\frac{1}{16}$	-2
$\frac{1}{4}$	-1
1	0
4	1
16	2



CP's: 5.2.3 Salmon worksheet

Remember: Investigating a function

- Multiple representations
- Domain and Range
- Intercepts
- Special Points → (1, 0)
- Symmetry No
- Asymptotes $x = 0$
- Continuous or Discrete
- Shape: curved or straight

exp.

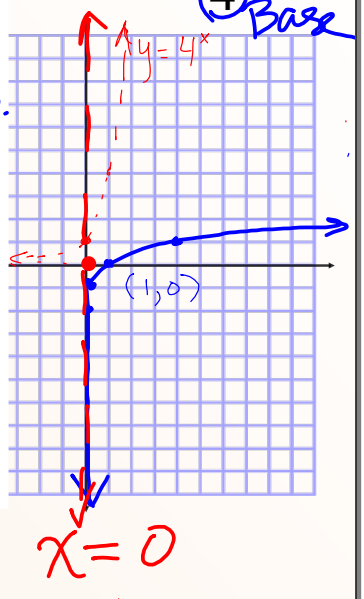
$y = \log_4 x$

Base

$4^y = x$

exp.

x	y
1/16	-2
1/4	-1
1	0
4	1
16	2



HW: Checkpoint Problems in the back of your book. Copy the original problem and clearly show your steps starting with #13 on CP10 and all problems on CP19.

page CP10, # 1- 24

page CP 19, # 2 - 12 even